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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,809	08/25/2003	Thomas J. Kelly	08350.3304-03	1320

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CATERPILLAR/FINNEGAN, HENDERSON, L.L.P.  
901 New York Avenue, NW  
WASHINGTON, DC 20001-4413

EXAMINER
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PARK, JEONG S

ART UNIT	PAPER NUMBER
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2454

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12/05/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/646,809	<b>Applicant(s)</b> KELLY ET AL.	
	<b>Examiner</b> JEONG S. PARK	<b>Art Unit</b> 2454	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 26-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 and 26-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/30/2008</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This communication is in response to Application No. 10/646809 filed on 8/25/2003. The amendment presented on 9/30/2008, which amends claims 1-24 and 26-38, is hereby acknowledged. Claims 1-24 and 26-38 have been examined.

#### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-24 and 26-38 have been considered but are moot in view of the new ground(s) of rejection.

In response to the applicant's arguments on Gandolfo's network of personal wireless devices does not constitute an ad-hoc network including a plurality of work machine, the examiner respectfully disagrees because Gandolfo teaches as follows:

Network of devices are connected in an ad-hoc fashion (see, e.g., page 1, paragraph [0009]); and

Each device of the network can be also used as work related machine (see, e.g., page 1, paragraph [0010]).

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-11, 13, 14, 16-24, 26-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo (U.S. Pub. No. 2003/0224787 A1) in view of Falada et al. (hereinafter Falada)(U.S. Pub. No. 2002/0099520 A1).

Regarding claims 1, 26 and 38, Gandolfo teaches as follows:

a method for dynamically establishing an ad-hoc network including a plurality of work machines (building communications paths across the multi-hop ad-hoc network, see, e.g., page 3, paragraph [0037]), one or more of which may move within a work environment and each of which includes a gateway (PHY layer 410 in figure 4A communicates with the rest of the network via wireless link, see, e.g., page 2, paragraph [0014]), the method performed by a respective gateway included within a respective one of the work machines and comprising:

identifying a first sub-network (first network or network A 550a in figure 5) of the plurality work machines (first devices) within direct communication range of the respective work machine (the first controller having a first usable physical area indicating a farthest distance to which the first controller can successfully communicate, see, e.g., page 3, paragraph [0038]);

storing, by the respective work machine (the first controller for controlling operation of the first network, see, e.g., page 3, paragraph [0041]), information identifying and associating each of the work machines in the first sub-network (control and administrative information between the controller and the various devices, see, e.g., page 2, paragraph [0021]);

identifying a second sub-network (second network, see, e.g., page 3, paragraph [0038] or network C 550c in figure 5) of the plurality work machines that are in direct communication range of one or more of the work machines in the first sub-network and each other, the second sub-network including at least one work machine not included in

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the first sub-network (overlapping networks, see, e.g., page 4, paragraph [0064]-[0065] and figure 5);

storing, by the respective work machine (the first controller for controlling operation of the first network, see, e.g., page 3, paragraph [0041]), information identifying and associating each of the work machines in the second sub-network (control and administrative information between the controller and the various devices, see, e.g., page 2, paragraph [0021]);

forwarding a packet received from a first work machine (device A-1 521a in figure 6B) included in the first sub-network (550a in figure 6B) to a second work machine (device A-2 522a in figure 6B) included in the first sub-network based on a determination that the second work machine is either directly or indirectly within communication range of a third work machine (device B-1 521b in figure 6B) included in the second sub-network (550b in figure 6B)(hidden overlapping networks, see, e.g., page 6, paragraph [0086]-[0088]); and

updating the stored information identifying and associating the work machines included in the first and second sub-networks of the plurality of work machines based on at least one of: the respective work machine changing locations within the environment and any of the work machines included in the first or second sub-networks changing locations within the environment (discovering the links between mobile devices and to build and update those paths so any user can communicate with any other users, see, e.g., page 4, paragraph [0063]).

Gandolfo does not teach of exchanging information relating to an operational parameter of a mechanical system on-board one of the plurality of work machines.

Falada teaches as follows:

a system and method for displaying information related to the status of at least one machine of a plurality of machines (see, e.g., abstract);

a data module coupled to each of the plurality of machines and the data module is adapted to collect and store information related to the corresponding machine (see, e.g., page 2, paragraph [0050] and figure 1);

a machine includes work machines and automobiles (see, e.g., page 3, paragraph [0054]); and

collecting an operational parameter (the machine generates a set of data or information relating to their operation and the data module of each vehicle relays the stored information across the data link (see, e.g., page 3, paragraph [0057])).

It would have been obvious for one of ordinary skill in the art at the time of the invention to combine Gandolfo to include a work machine coupled with a data module (the data module is equivalent to Gandolfo's network device or mobile device) as taught by Falada in order to efficiently monitor plurality of work machines over the communication data link.

Regarding claims 2, 3, 22-24, 27 and 28, Gandolfo teaches as follows:

wherein the packet is destined for a destination work machine (device B-1 521b) not included in the first (550a) or second (560a) sub-networks of the plurality of work

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machines, and forwarding the packet to the destined or any work machine via second and third work machines based on the determination achieved by the claim 1 (indirect overlapping networks, see, e.g., page 6, paragraph [0090] and figure 6C).

Regarding claims 4, 5, 16, 17, 29 and 30, Gandolfo teaches as follows:

broadcasting an admission packet (the controller sends the beacon to all of the devices, see, e.g., page 2, paragraph [0019] and page 5, paragraph [0077]);

each beacon contains information including contention access period (see, e.g., page 2, paragraph [0020]); and

the network passes control and administrative information between the controller and the various devices through the received contention access period information through the beacon from the controller (see, e.g., page 2, paragraph [0021]).

Regarding claims 6-9, 14, 18, 19 and 31-34, Gandolfo teaches as follows:

updating the respective work machine periodically based on the location and removing any work machines not in direct communications with any work machines (discovering the links between mobile devices and to build and update those paths so any user can communicate with any other users, see, e.g., page 4, paragraph [0063]).

Regarding claims 10, 20 and 35, Gandolfo teaches as follows:

selecting one of the at least two data links to forward the packet to the first work machine based on at least one of an availability status of each of the data links, a cost of communicating over each data link, a quality of service associated with each data link, a priority of the packet, and a transmission time associated with each data link

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(selecting its network by choosing a controller based on link quality, see, e.g., page 5, paragraph [0078]).

Regarding claims 11 and 36, Gandolfo teaches as follows:

forwarding a destined packet to the second work machine based on the first network table (network information data exchanged between controllers, see, e.g., page 4, paragraph [0050]).

Regarding claim 13, Gandolfo teaches as follows:

a system for dynamically establishing communications between a plurality of work machines (building communications paths across the multi-hop ad-hoc network, see, e.g., page 3, paragraph [0037]), one or more of which may move within an environment (discovering the links between mobile devices and to build and update those paths so any user can communicate with any other users, see, e.g., page 4, paragraph [0063]), the system comprising:

a first work machine positioned in a first location within the environment (the first controller having a first usable physical area indicating a farthest distance to which the first controller can successfully communicate, see, e.g., page 3, paragraph [0038]), a first gateway included in the first work machine that connects an on-board data link with an off-board data link (PHY layer 410 in figure 4A communicates with the rest of the network via wireless link, see, e.g., page 2, paragraph [0014]);

a network table (network information data, see, e.g., page 3, paragraph [0039]) included in the first gateway that identifies work machines that are either directly or indirectly within communication range of the first work machine (the first controller

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having a first usable physical area indicating a farthest distance to which the first controller can successfully communicate, see, e.g., page 3, paragraph [0038]), wherein the network table contains:

information identifying and associating a first sub-network of the plurality of work machines that are within communication range of the first work machine and other (the first controller having a first usable physical area indicating a farthest distance to which the first controller can successfully communicate, see, e.g., page 3, paragraph [0038]); and

information identifying a second sub-network the plurality of work machines that are within direct communication range of at least one of the work machines in the first sub-network and each other, the second sub-network including at least one work machine not included in the first sub-network (overlapping networks, see, e.g., page 4, paragraph [0064]-[0065] and figure 5);

wherein the first gateway is configured to:

updating the network table based on at least one of the first work machine changing locations within the environment and any of the work machines included in the first or second sub-networks changing locations within the environment (discovering the links between mobile devices and to build and update those paths so any user can communicate with any other users, see, e.g., page 4, paragraph [0063]);

receive a packet over the off-board data link from a second work machine included in the first sub-network, wherein the packet identifies a destination work

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machine (it is inherent to send a packet after discovering the links and building communication paths, see, e.g., page 2, paragraph [0023]);

forward the received packet to a third work machine included in the first sub-network based on a determination that the destination work machine is associated with the third work machine in the network table (hidden overlapping networks, see, e.g., page 6, paragraph [0086]-[0088]) and figure 6A-C); and

send information included in the received packet to the on-board data link when the packet identifies the first work machine as the destination work machine (PHY layer receives a packet from the off-board data link and sends to the upper layers, see, e.g., page 2, paragraph [0014]).

Gandolfo does not teach of exchanging information relating to an operational parameter of a mechanical system on-board one of the plurality of work machines.

Falada teaches as follows:

a system and method for displaying information related to the status of at least one machine of a plurality of machines (see, e.g., abstract);

a data module coupled to each of the plurality of machines and the data module is adapted to collect and store information related to the corresponding machine (see, e.g., page 2, paragraph [0050] and figure 1);

a machine includes work machines and automobiles (see, e.g., page 3, paragraph [0054]); and

collecting an operational parameter (the machine generates a set of data or information relating to their operation and the data module of each vehicle relays the stored information across the data link (see, e.g., page 3, paragraph [0057]).

It would have been obvious for one of ordinary skill in the art at the time of the invention to combine Gandolfo to include a work machine coupled with a data module (the data module is equivalent to Gandolfo's network device or mobile device) as taught by Falada in order to efficiently monitor plurality of work machines over the communication data link.

Regarding claim 21, Gandolfo teaches as follows:

translate the information included in the received packet to a format compatible with the on-board data link when the packet identifies the first work machine as the destination work machine (mobile host, as well known within the art, handles an application layer as a network host, so if the packet is destined to that host, then it will process the packet to upper layer with an accepted format to the upper layer, see, e.g., page 2, paragraph [0014]).

5. Claims 12, 15 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo (U.S. Pub. No. 2003/0224787 A1) in view of Falada et al. (hereinafter Falada)(U.S. Pub. No. 2002/0099520 A1), and further in view of Computer Networks a Systems Approach Section 4.2.2 (by Larry L. Peterson et al., 2dn edition, pages 284-288, published by Morgan Kaufmann Publishers, on October 1999).

Regarding claims 12, 15 and 37, Gandolfo in view of Falada does not teach of building and using two network tables to forward a packet to a destination.

The general concept of building and using routing tables is well known within the art as illustrated by Computer Networks a Systems Approach Section 4.2.2 which teaches as follows:

initial distances stored at each node (each node knows all connections to its neighbors, see, e.g., page 284, third paragraph, Figure 4.14, Table 4.5 on page 285);

an initial routing table from the step of exchanging its personal list of distances between its directly connected neighbors (see, e.g., page 285, first paragraph, Table 4.5, Figure 4.14); and

a final routing table resulted from a few exchanges of the information between neighbors (see, e.g., page 286, first and second paragraph, Table 4.7 and 4.8, Figure 4.14).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Gandolfo in view of Falada to include a routing table which includes all direct and indirect connections for each node, as taught by Computer Networks a Systems Approach Section 4.2.2 in order to simplify the routing process.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEONG S. PARK whose telephone number is (571)270-1597. The examiner can normally be reached on Monday through Friday 7:00 - 3:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. P./  
Examiner, Art Unit 2454

December 2, 2008

/Dustin Nguyen/  
Primary Examiner, Art Unit 2454